In the Claims:

1. (previously presented) A position-burst demodulator, comprising:

an input circuit operable to receive even and odd samples of a first servo position burst, to add the even samples to generate a first sum and to add the odd samples to generate a second sum;

an intermediate circuit coupled to the input circuit and operable to square the first and second sums, and to add the squared first and second sums to generate a third sum; and

an output circuit coupled to the intermediate circuit and operable to calculate the square root of the third sum.

2. (previously presented) The demodulator of claim 1 wherein the even and odd samples comprise consecutive samples.

3. (previously presented) The demodulator of claim 1 wherein the even and odd samples comprise average samples.

4. (previously presented) A position-burst demodulator, comprising:

an input circuit operable to receive and square first and second samples of a first servo position burst;

an intermediate circuit coupled to the input circuit and operable to add the squared first and second samples to generate a first sum;

an output circuit coupled to the intermediate circuit and operable to calculate the square root of the first sum;

wherein the input circuit is operable to receive and square first and second samples of a second servo position burst;

wherein the intermediate circuit is operable to add the squared first and second samples of the second servo position burst to generate a second sum;

wherein the output circuit is operable to calculate the square root of the second sum; and

a difference circuit operable to calculate a difference between the square roots of the first and second sums.

5. (previously presented) A position-burst demodulator, comprising:

a first adder operable to receive even and odd samples of a first servo position burst, to add the even samples together to generate a first sum, and to add the odd samples together to generate a second sum;

a power circuit coupled to the first adder and operable to square the first sum and the second sum to respectively generate first and second squared sums;

a second adder coupled to the power circuit and operable to add the first and second squared sums to generate a first sum of squares; and

a root circuit coupled to the second adder and operable to calculate the square root of the first sum of squares.

6. Cancelled.

7. (previously presented) The demodulator of claim 5 wherein the first adder is operable to add the magnitudes of the even samples together to generate the first sum and to add the magnitudes of the odd samples together to generate the second sum.

8. (previously presented) A position-burst demodulator, comprising:

a first adder operable to receive first and second sets of samples of a first servo position burst, to add the samples in the first set together to generate a first sum, and to add the samples in the second set together to generate a second sum;

a power circuit coupled to the first adder and operable to square the first sum and the second sum to respectively generate first and second squared sums;

a second adder coupled to the squarer and operable to add the first and second squared sums to generate a first sum of squares;

a root circuit coupled to the second adder and operable to calculate the square root of the first sum of squares;

wherein the first adder is operable to receive first and second sets of samples of a second servo position burst, to add the samples in the first set together to generate a third sum, and to add the samples in the second set together to generate a fourth sum;

wherein the power circuit is operable to square the third sum and the fourth sum to respectively generate third and fourth squared sums;

wherein the second adder is operable to add the third and fourth squared sums to generate a second sum of squares;

wherein the root circuit is operable to calculate the square root of the second sum of squares; and

a difference circuit coupled to the root circuit and operable to calculate a difference between the square roots of the first and second sums of squares.

9. (previously presented) A position-burst demodulator, comprising:

a first adder operable to receive first and second sets of samples of a first servo position burst, to add the samples in the first set together to generate a first sum, and to add the samples in the second set together to generate a second sum;

a power circuit coupled to the first adder and operable to square the first sum and the second sum to respectively generate first and second squared sums;

a second adder coupled to the squarer and operable to add the first and second squared sums to generate a first sum of squares;

a root circuit coupled to the second adder and operable to calculate the square root of the first sum of squares;

wherein the first adder is operable to receive first and second sets of samples of a second servo position burst, to add the samples in the first set together to generate a third sum, and to add the samples in the second set together to generate a fourth sum;

wherein the power circuit is operable to square the third sum and the fourth sum to respectively generate third and fourth squared sums;

wherein the second adder is operable to add the third and fourth squared sums to generate a second sum of squares;

wherein the root circuit is operable to calculate the square root of the second sum of squares;

a memory operable to store the square roots of the first and second sums of squares; and

a difference circuit coupled to the memory and operable to calculate a difference between the stored square roots of the first and second sums of squares.

10. (previously presented) A circuit operable to:

add even samples of a first servo position burst to generate a first sum;

add odd samples of the first servo position burst to generate a second sum;

square the first and second sums;

add the squared first and second sums to generate a third sum; and

calculate the square root of the third sum.

11. (previously presented) A circuit operable to:

square first and second samples of a first servo position burst;

add the squared first and second samples to generate a first sum;

calculate the square root of the first sum;

square first and second samples of a second servo position burst;

add the squared first and second samples of the second servo position burst to generate a second sum;

calculate the square root of the second sum; and

calculate a difference between the square roots of the first and second sums.

12. (previously presented) A circuit operable to:

receive fewer than ten total samples per cycle of a first servo position burst, the total samples including even and odd samples;

receive fewer than ten total samples per cycle of a second servo position burst, the total samples including even and odd samples;

sum the even samples for the first servo position burst;

sum the odd samples for the first servo position burst;

square the summed even samples for the first servo position burst;

square the summed odd samples for the first servo position burst;

sum the squared sums of the even and odd samples for the first servo position burst;

obtain the square root value of the summed squared sums of the even and odd samples for the first servo position burst;

perform the same operations on the even and odd samples for the second servo position burst; and

calculate from the square root values a head-position error signal from the samples of the first and second bursts only such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts.

13. (original) The circuit of claim 12, further operable to generate the samples of the first and second servo position bursts.

14. (previously presented) A disk-drive system, comprising:

a data-storage disk having a surface, data tracks defined on the surface, the data tracks having respective centers, the data-storage disk also having servo wedges located in the tracks, each servo wedge including position bursts;

a motor coupled to and operable to rotate the disk;

a read head operable to generate a read signal that represents the position bursts;

a read-head positioning circuit operable to move the read head toward the center of a data track in response to a position-error signal; and

a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit operable to

sample the read signal,

square first and second samples of both a first position burst and a second position burst in a servo wedge located in the data track,

add the squared first and second samples of the first position burst to generate a first sum and add the squared first and second samples of the second position burst to generate a second sum,

calculate a first square root of the first sum and a second square root of the second sum,

calculate a difference between the first and second square roots, and

generate the position-error signal equal to the difference.

15. (previously presented) A disk-drive system, comprising:

a data-storage disk having a surface, data tracks defined on the surface, the data tracks having respective centers, the data-storage disk also having servo wedges located in the tracks, each servo wedge including position bursts;

a motor coupled to and operable to rotate the disk;

a read head operable to generate a read signal that represents the position bursts;

a read-head positioning circuit operable to move the read head toward the center of a data track in response to a position-error signal; and

a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit operable to

sample the read signal fewer than ten times per cycle of the position bursts, and

calculate the position-error signal from the samples of no more than two of the position bursts by, for each positon burst, summing the even samples, summing the odd samples, squaring the sum of even samples, squaring the sum of odd samples, taking the square root of the squared sums, and taking the difference between the square root of the squared sums, such that the accuracy of the position-error signal is independent of the timing of the samples with respect to the read signal.

16. (previously presented) A method, comprising:

generating a first sum by adding even samples of a first servo position burst;

generating a second sum by adding odd samples of the first servo position burst;

squaring the first and second sums;

generating a third sum by adding the squared first and second sums together; and

calculating the square root of the third sum.

17.-18. Cancelled.

19. (previously presented) A method, comprising:

squaring first and second samples of a first servo position burst;

generating a first sum by adding the squared first and second samples together;

calculating the square root of the first sum;

squaring first and second samples of a second servo position burst;

generating a second sum by adding the squared first and second samples of the second servo position burst together;

calculating the square root of the second sum; and

calculating a difference between the square roots of the first and second sums.

20. (previously presented) A method, comprising:

receiving even and odd samples of a first servo position burst;

adding the even samples together to generate a first sum;

adding the odd samples together to generate a second sum;

squaring the first and second sums to respectively generate first and second squared sums;

adding the first and second squared sums together to generate a first sum of squares; and

calculating the square root of the first sum of squares.

21. Cancelled

22. (previously presented) The method of claim 20 wherein:

adding the even samples comprises adding the magnitudes of the even samples together to generate the first sum; and

adding the odd samples comprises adding the magnitudes of the odd samples together to generate the second sum.

23. (previously presented) A method, comprising:

receiving first and second sets of samples of a first servo position burst;

adding the samples in the first set together to generate a first sum;

adding the samples in the second set together to generate a second sum;

squaring the first and second sums to respectively generate first and second squared sums;

adding the first and second squared sums together to generate a first sum of squares;

calculating the square root of the first sum of squares;

receiving first and second sets of samples of a second servo position burst;

adding the samples in the first set together to generate a third sum;

adding the samples in the second set together to generate a fourth sum;

squaring the third sum and the fourth sum to respectively generate third and fourth squared sums;

adding the third and fourth squared sums to generate a second sum of squares;

calculating the square root of the second sum of squares; and

calculating a difference between the square roots of the first and second sums of squares.

24. (previously presented) A method, comprising:

receiving fewer than ten total samples per cycle of a first servo position burst, the total samples including even and odd samples;

receiving fewer than ten total samples per cycle of a second servo position burst, the total samples including even and odd samples;

summing the even samples for the first servo position burst;

summing the odd samples for the first servo position burst;

squaring the summed even samples for the first servo position burst;

squaring the summed odd samples for the first servo position burst;

summing the squared sums of the even and odd samples for the first servo position burst;

obtaining the square root value of the summed squared sums of the even and odd samples for the first servo position burst;

repeating the operations of summing through obtaining on the even and odd samples for the second servo position burst; and

calculating from the square root values a head-position error signal from the samples of the first and second bursts only such that the accuracy of the error signal is independent of the location of the samples with respect to the bursts.

25. (original) The method of claim 24, further comprising generating the samples of the first and second servo position bursts.

26. (previously presented) A method, comprising:

generating a read signal with a read head, the read signal representing position bursts on a data-storage disk;

sampling the read signal;

squaring first and second samples of both a first position burst and a second position burst located in a data track of the disk;

adding the squared first and second samples of the first position burst to generate a first sum;

adding the squared first and second samples of the second position burst to generate a second sum;

calculating a first square root of the first sum;

calculating a second square root of the second sum;

calculating a difference between the first and second square roots;

generating a position-error signal equal to the difference; and

moving the read head toward the center of the data track in response to the position-error signal.

27. (previously presented) A method, comprising:

generating a read signal with a read head, the read signal representing position bursts on a data-storage disk;

sampling the read signal fewer than ten times per position-burst cycle;

calculating a position-error signal from the samples of no more than two of the position bursts by, for each positon burst, summing the even samples, summing the odd samples, squaring the sum of even samples, squaring the sum of odd samples, taking the square root of the squared sums, and taking the difference between the square root of the squared sums, such that the accuracy of the position-error signal is independent of the timing of the samples with respect to the read signal; and

moving the read head toward the center of a data track on the disk in response to the position-error signal.

28. (previously presented) A circuit operable to:

receive even and odd samples of first and second servo position bursts;

sum the even samples for each of the first and second servo position bursts;

sum the odd samples for each of the first and second servo position bursts; and

calculate a head-position error signal from the sums of the even and odd samples of the first and second bursts only such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts.

29. (previously presented) A method, comprising:

receiving even and odd samples of first and second servo position bursts;

summing the even samples for each of the first and second servo position bursts;

summing the odd samples for each of the first and second servo position bursts; and

calculating a head-position error signal from the samples of the first and second bursts only such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts.

30. (previously presented) The position-burst demodulator of claim 1 wherein the input circuit is operable to add the magnitudes of the even samples to generate the first sum and to add the magnitudes of the odd samples to generate the second sum.

31. (previously presented) The position-burst demodulator of claim 1 wherein the input circuit is operable to invert every other even sample and add the inverted and noninverted even samples to generate the first sum, and is operable to invert every other odd sample and add the inverted and noninverted odd samples to generate the second sum.

32. (previously presented) The position-burst demodulator of claim 5 wherien the first adder is operable to invert every other even sample and add the inverted and noninverted even samples to generate the first sum, and is operable to invert every other odd sample and add the inverted and noninverted odd samples to generate the second sum.

33. (previously presented) The position-burst demodulator of claim 8, wherein the first adder is operable to add the magnitudes of the samples of the first servo position burst in the first set together to generate the first sum, add the magnitudes of the samples of the first servo position burst in the second set together to generate the second sum, to add the samples of the second servo position burst in the first set together to generate the third sum, and add the samples of the second servo position burst in the second set together to generate the fourth sum.

34. (previously presented) The position-burst demodulator of claim 8, wherein the first adder is operable to invert every of sample of the first servo position burst in the first set and add the inverted and noninverted siamples together to generate the first sum, invert every other sample of the first servo position burst in the second set and add the inverted and noninverted samples together to generate the second sum, invert every other sample of the second servo position burst in the first set and add the inverted and noninverted samples together to generate the third sum, and invert every

other sample of the second servo position burst in the second set and add the inverted and noninverted samples together to generate the fourth sum.

35. (previously presented) The position-burst demodulator of claim 9, wherein the first adder is operable to add the magnitudes of the samples of the first servo position burst in the first set together to generate the first sum, add the magnitudes of the samples of the first servo position burst in the second set together to generate the second sum, to add the samples of the second servo position burst in the first set together to generate the third sum, and add the samples of the second servo position burst in the second set together to generate the fourth sum.

36. (previously presented) The position-burst demodulator of claim 9, wherein the first adder is operable to invert every of sample of the first servo position burst in the first set and add the inverted and noninverted siamples together to generate the first sum, invert every other sample of the first servo position burst in the second set and add the inverted and noninverted samples together to generate the second sum, invert every other sample of the second servo position burst in the first set and add the inverted and noninverted samples together to generate the third sum, and invert every other sample of the second servo position burst in the second set and add the inverted and noninverted samples together to generate the fourth sum.

37. (previously presented) The circuit of claim 10, further operable to add the magnitudes of the even samples to generate the first sum and to add the magnitudes of the odd samples to generate the second sum.

38. (previously presented) The circuit of claim 10, further operable to invert negative ones of the even samples and to add the inverted and noninverted even samples to generate the first sum, and further operable to invert negative ones of the odd samples and to add the inverted and noninverted odd samples to generate the second sum.

39. (previously presented) The circuit of 12 wherein:

summing the even samples for the first servo position burst comprises summing the magnitudes of the even samples; and

summing the odd samples for the first servo position burst comprises summing the magnitudes of the odd samples for the first servo position burst.

40. (previously presented) The circuit of 12 wherein:

summing the even samples for the first servo position burst comprises inverting every other even sample summing the inverted and noninverted even samples; and

summing the odd samples for the first servo position burst comprises inverting every other odd sample and summing the inverted and noninverted odd samples.

41. (previously presented) The disk-drive system of claim 15 wherein the servo circuit is operable to sum the even samples by summing the magnitudes of the even samples and is operable to sum the odd samples by summing the magnitudes of the odd samples.

42. (previously presented) The disk-drive system of claim 15 wherein the servo circuit is operable to sum the even samples by inverting every other even sample and summing the inverted and noninverted even samples, and is operable to sum the odd samples by inverting every other odd sample and summing the inverted and noninverted odd samples.

43. (previously presented) The method of claim 16, wherein:

generating the first sum comprises generating the first sum by adding the magnitudes of the even samples; and

generating the second sum comprises generating the second sum by adding the magnitudes of the odd samples.

44. (previously presented) The method of claim 16, wherein:

generating the first sum comprises generating the first sum by inverting every other even sample and adding the inverted and noninverted even samples; and

generating the second sum comprises generating the second sum by inverting every other odd sample and adding the inverted and noninverted odd samples.

45. (previously presented) The method of claim 20 wherein:

adding the even samples together comprises adding the absolute values of the even samples together to generate the first sum; and

adding the odd samples together comprises adding the absolute values of the odd samples together to generate the second sum.

46. (previously presented) The method of claim 20 wherein:

adding the even samples together comprises inverting every other even sample and adding the inverted and noninverted even samples together to generate the first sum; and

adding the odd samples together comprises inverting every other odd sample and adding the inverted and noninverted odd samples together to generate the second sum.

47. (previously presented) The method of claim 23 wherein:

adding the samples of the first position burst in the first set together comprises adding the magnitudes of the samples in the first set together to generate the first sum;

adding the samples of the first position burst in the second set together comprises adding the magnitudes of the samples in the second set together to generate the second sum;

adding the samples of the second position burst in the first set together comprises adding the magnitudes of the samples in the first set together to generate the third sum; and

adding the samples of the second position burst in the second set together comprises adding the magnitudes of the samples in the second set together to generate the fourth sum.

48. (previously presented) The method of claim 23 wherein:

adding the samples of the first position burst in the first set together comprises inverting every other sample in the first set and adding the inverted and noninverted samples in the first set together to generate the first sum;

adding the samples of the first position burst in the second set together comprises inverting every other sample in the second set and adding the inverted and noninverted samples in the second set together to generate the second sum;

adding the samples of the second position burst in the first set together comprises inverting every other sample in the first set and adding the inverted and noninverted samples in the first set together to generate the third sum; and

adding the samples of the second position burst in the second set together comprises inverting every othe sample in the second set and adding the inverted and noninverted smaples in the second set together to generate the fourth sum.

49. (previously presented) The method of claim 24 wherein:

summing the even samples for the first servo position burst comprises summing the magnitudes of the even samples; and

summing the odd samples for the first servo position burst comprises summing the magnitudes of the odd samples.

50. (previously presented) The method of claim 24 wherein:

summing the even samples for the first servo position burst comprises inverting every other even sample and summing the inverted and noninverted even samples; and

summing the odd samples for the first servo position burst comprises inverting every other odd sample and summing the inverted and noninverted odd samples.

51. (previously presented) The method of claim 27 wherein:

summing the even samples comprises summing the magnitudes of the even samples; and

summing the odd samples comprises summing the magnitudes of the odd samples for the first servo position burst.

52. (previously presented) The method of claim 27 wherein:

summing the even samples comprises inverting every other even sample and summing the inverted and noninverted even samples; and

summing the odd samples comprises inverting every other odd sample and summing the inverted and noninverted odd samples.

53. (previously presented) The circuit of claim 28 wherein:

summing the even samples comprises summing the magnitudes of the even samples; and

summing the odd samples comprises summing the magnitudes of the odd samples for the first servo position burst.

54. (previously presented) The circuit of claim 28 wherein:

summing the even samples comprises inverting every other even sample and summing the inverted and noninverted even samples; and

summing the odd samples comprises inverting every other odd sample and summing the inverted and noninverted odd samples.

55. (previously presented) The method of claim 29 wherein:

summing the even samples comprises summing the magnitudes of the even samples; and

summing the odd samples comprises summing the magnitudes of the odd samples for the first servo position burst.

56. (previously presented) The method of claim 29 wherein:

summing the even samples comprises inverting every other even sample and summing the inverted and noninverted even samples; and

summing the odd samples comprises inverting every other odd sample and summing the inverted and noninverted odd samples.